

# **CLEAR-COM ECLIPSE**

**ICS 92/52 INTERCOM PANELS**

**INSTRUCTION MANUAL**

ICS 92/52 Intercom Panels Instruction Manual

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# IMPORTANT SAFETY INSTRUCTIONS

**For your safety, it is important to read and follow these instructions before operating an ICS-92/52 intercom station:**

*Please read and follow these instructions before operating an ICS-92/52 intercom station.*

- (1) **WARNING:** To reduce the risk of fire or electric shock, do not expose an ICS-92/52 intercom station to rain or moisture. Do not operate an ICS-92/52 intercom station near water, or place objects containing liquid on it. Do not expose an ICS-92/52 intercom station to splashing or dripping water.
- (2) For proper ventilation, make sure ventilation openings are not blocked. Install the ICS-92/52 according to the directions in the Installation Chapter of this manual.
- (3) Do not install an ICS-92/52 intercom station near a heat source such as a radiator, heat register, stove, or other apparatus (including amplifiers) that produces heat. Do not place naked flame sources such as candles on or near an i-station.
- (4) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades, with one blade wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- (5) Protect the power plug from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the i-station's chassis.
- (6) Only use attachments/accessories specified by Clear-Com Communication Systems.
- (7) Unplug the ICS-92/52 station during lightning storms or when unused for long periods of time.
- (8) Refer all servicing to qualified service personnel. Servicing is required when:
  - The ICS-92/52 station has been damaged in any way, such as when a power-supply cord or plug is damaged.
  - Liquid has been spilled or objects have fallen into the ICS-92/52 station's chassis.
  - The ICS-92/52 station has been exposed to rain or moisture.
  - The ICS-92/52 station does not operate normally.
  - The ICS-92/52 station has been dropped.

Please familiarize yourself with the safety symbols in Figure 1. When you see these symbols on an ICS-92/52 intercom station, they warn

you of the potential danger of electric shock if the station is used improperly. They also refer you to important operating and maintenance instructions in the manual.



This symbol alerts you to the presence of uninsulated dangerous voltage within the product's enclosure that might be of sufficient magnitude to constitute a risk of electric shock. Do not open the product's case.



This symbol informs you that important operating and maintenance instructions are included in the literature accompanying this product.

*Figure 1: Safety Symbols*





# OPERATION

## INTRODUCTION

This chapter describes how to operate the ICS-92 and ICS-52 intercom panels and their digital equivalents, the ICS-92T and ICS-52T intercom panels. Panel operators can use this manual after the Eclipse System has been correctly installed and configured.

## DESCRIPTION

The ICS-92/92T and ICS-52/52T intercom panels are each assembled in a small 1-RU high (1.75 in. or 44.45 mm) chassis. The ICS-92/92T has nine selector keys; the ICS-52/52T has five. The ICS-92/92T and ICS-52/52T have the following features:

- Individually adjustable listen levels
- Panel fits in one vertical rack unit (1.75 in. or 44.45 mm)
- A five character LED display above each selector key
- Built-in speaker and optional plug-in panel microphone
- Front-panel headset connector
- Call signaling capability
- “Answer Back” facility
- Local program input
- Programmable relay
- Mute relay
- Two logic inputs for external control of selected panel functions.

The ICS-92/92T and ICS-52/52T can be equipped with the following options:

- XPL-12/22 expansion key panels
- OPT-100 auxiliary audio output

# FRONT-PANEL CONTROLS AND INDICATORS

The front-panel controls and indicators include:

- Communication-error indicator
- Talk/listen selectors and indicators
- “Answer Back” facility
- Function buttons

## Communication-Error Indicator

If the panel should lose data communication with the matrix frame, all of the red LEDs will flash slowly.

When data communication is restored, the panel will automatically return to normal operation.

## Speaker/Headset Level Controls

To adjust the speaker or headset volume, use the “intercom” volume controls. The speaker volume can also be affected by three software-controlled functions: Page Override, Mute Level, and Listen Level Adjustment.

### Intercom Volume

The “Intercom” volume control sets the overall level of all signals coming from the matrix frame, except for the page mode, which is controlled by an internal software function (see the next section, “Page Override”).

### Page Override

Page override is a special function in the panel in which the intercom volume defaults to a preset value when commanded to by the central matrix. Any fixed group can be assigned the page-override function through the configuration program.

The configuration program determines preset value for each panel. If the preset value is lower than the setting of the front-panel volume control, the volume will be controlled by the front-panel control.

### Mute Level

This turns down the speaker level when any talk is active at the panel. The amount of muting (measured in dB) is set by the configuration program for each panel. This function helps prevent possible feedback. The maximum amount of muting is 15 dB below full volume. If the front panel control is set below that level, then muting will have no effect.

### Listen Level Adjustment

The level of any active listen path can be adjusted individually. Refer to “Listen Level Mode” on page 1-6.

## **Talk/Listen Selectors and Indicators**

The following section describes the operation of the talk/listen selectors and their associated indicators.

### **Selector Operation**

The selectors operate as both talk and listen selectors; they also work as volume controls when the panel is in listen-level mode (see “Listen Level Button” on page 1-6). Pressing a selector down accesses a talk label; pushing it up accesses a listen label. Pushing the talk selector down and quickly releasing it will “latch” the selector and the talk path will stay active until it is pressed again. Pressing and holding a talk selector causes the talk path to stay active only for as long as it is held down. Listen selectors operate in the same manner.

To prevent the selector on the panel from latching in the talk position (local latch disable), or to prevent any panel from latching a talk to the panel (global latch disable) use the configuration program.

### **Display Screen**

The “Answer Back” selector and each talk/listen selector has a five-character LED display above it to indicate its assigned label. If more than one talk label is assigned to a talk selector, only the first one will be displayed.

Pushing the “Listen Labels” button will toggle the talk/listen selector display between the talk and listen labels. The green LED next to the “Listen Labels” button will light when the listen labels are displayed.

### **Talk and Listen Indicators**

When a talk path is active, the red LED above the selector lights continuously. When a listen path is active, the green LED above the selector lights continuously.

### **Monitoring/Eavesdropping Indicators**

If any other panel begins monitoring a panel a beep (the monitoring-alert tone) will sound at the panel.

To inhibit the monitoring-alert tone, use the configuration program.

### **Call-Waiting Indicator**

If a panel calls another panel with a selector programmed for that label, the LED will rapidly flash red. This flashing is a call-waiting tally. To answer the incoming call, push the indicated talk selector. The call-waiting tally will be cleared when the call is answered or after the call is terminated and the answer-back, auto-clear time out lapses.

Regardless of whether a selection is programmed with a caller’s label, the label will be placed in the answer-back stack (see “Removing Labels from the Answer-Back Stack” on page 1-5).

### **In-Use Tally Indicator**

If a selector is assigned to a label and another panel is currently using that label, the LED will double-flash once per second to indicate the label is in use. This tally must be enabled from the configuration software.

### **Telephone Off-Hook Tally Indicator**

When a telephone interface is assigned to a talk selector, the talk LED will flash once per second if that telephone is off the hook. This tally must be enabled from the configuration program.

### **Radio Receiver Active Tally Indicator**

When a two-way radio interface port is assigned to a talk selector, the LED will flash once per second when that radio's receiver is active. This tally must be enabled from the configuration program.

### **Panel Connected Tally Indicator**

This tally is used when a panel is connected to the frame by a high-speed data line (such as an ISDN or T1 line) that might be inactive periodically. The red LED of any talk selector associated with that panel will flash once per second when the panel is on-line. This tally must be enabled from the configuration program.

### **Audio Presence Tally Indicator**

When a label is assigned to a listen selector, the LED will flash once per second to indicate someone is talking on that channel. This tally must be enabled from the configuration program.

## **Answer-Back Facility**

The primary function of the answer-back facility is to answer calls from other panels or interfaces not assigned to a panel's selectors. Panels and interfaces that are assigned to a panel's selectors also can be answered with the answer-back facility.

The following sections describe the use of the answer-back facility.

### **Answer Back Display**

The answer-back display is located above the "Answer Back" key. It displays the call that is next in line from a list of as many as eight incoming calls. This list is referred to as the answer-back stack.

### **Answer Back Selector**

The "Answer Back" selector answers calls from panels and interfaces that are both assigned and unassigned to the panel.

When a call arrives from a panel or interface:

- The calling panel's label will be placed in the answer-back stack and be shown in the answer-back display. The maximum stack size is eight calls.
- The red LED will flash.

These two conditions will continue until the call is answered, or until the answer-back time-out period lapses and the caller's label is automatically removed. To answer the call, push the "Answer Back" selector. The red LED will turn off and the green LED will turn on, indicating an active talk path to the caller. The talk path is active for as long as the selector is held.

***Note: The "Answer Back" selector cannot be latched; it is a momentary-only function.***

Calls from panels or interfaces assigned to panel selectors will also be indicated by their associated LEDs.

### **Answer-Back Label Selection**

If another call or calls comes in while using the answer-back selector:

- The user will hear the caller's voice
- The label will be placed in the answer-back stack.

To answer the next caller:

1. Push up on the "Answer Back" selector to remove the current caller and to display the next label in the answer-back stack.
2. Once the desired label is displayed, press the selector down to talk.

### **Removing Labels from the Answer-Back Stack**

Any label will be automatically removed from the stack if it is not answered within a certain time interval, which is set by the answer-back auto-clear time in the configuration program.

To manually remove the current caller's label from the answer-back stack, push up on the "Answer Back" selector.

## **Function Buttons**

The following are the panel's function selectors:

- Panel Mic
- Speaker On
- Mic On
- Listen Level.

### **Panel Mic Button**

This button selects the panel or headset microphone. If a headset is plugged in, the panel will automatically switch to headset microphone operation. If the headset is unplugged, the panel will automatically

switch back to panel microphone operation. The LED will be on when the panel microphone is active.

### **Mic On Button**

This button activates the panel or headset microphone, whichever has been selected. The green LED indicates when the microphone is on. If a talk is activated while the microphone is off, it will turn on.

### **Speaker On Button**

This button functions only when a headset is plugged into the panel. To toggle the speaker on and off, push the "Speaker On" button. The LED indicates when the speaker is on.

### **Listen Level Button**

The Listen Level button has four functions:

- Activating the listen-level mode
- Resetting the listen-level settings
- Sending call signals
- Releasing auto-answered telephone lines.

#### *Listen Level Mode*

To use the listen-level adjust mode:

1. Push (for less than 1 seconds) and quickly release the "Listen Level" button.
2. The LEDs of all active listen selectors will begin to flash to indicate the function is on.

***Note: Only active selectors can be adjusted in listen-level mode.***

3. Use the selector associated with the intended label to increase (up) or decrease (down) the volume.
4. To exit, push the "Listen Level" button or wait for the 3 seconds time-out.

***Note: If the active listen path is pushed higher than the maximum value, the other paths will be driven down so that the desired path has more emphasis.***

#### *Listen Level Reset*

To reset the Listen Level to default settings:

1. Press (for less than 1 second) and quickly release the "Listen Level" button.
2. Press and hold the "Listen Level" button for 3 seconds
3. Release the "Listen Level" button.

#### *Call Signals*

To activate a call signal:

1. Push and hold (for at least 1 second) the “Listen Level” button until the panel indicates it is in “Call Signal” mode.

The call signal will be sent each time the selector with that label assignment is pushed down and will remain so until the call-signal mode times out (about 5 seconds).

Call signals can be issued to any talk label assigned to a panel's talk/listen selectors. If more than one label is assigned to a selector, all labels will receive the signal. If a label is a fixed group, the entire group will receive the call signal. If the label is a party line, then every panel listening on the party line will receive the call signal.

#### *Remote Telephone Line Release*

This function is available only if specifically enabled in the configuration program. To hang up a telephone interface left off the hook:

1. Push and hold the “Listen Level” button for at least 1 second to activate the call-signal mode.
2. While holding the “Listen Level” button, press the talk selector of the desired telephone's label.
3. Release the “Listen Level” button.

***Note: In addition to hanging up the telephone interface, this will deactivate any talk/listen selector set to the interface from anywhere in the system.***

## **Listen Labels Button**

The “Listen Labels” button displays listen labels on the front panel and any display expansion panel (XPL-12 or XPL-22) connected to the panel. Momentarily pressing and quickly releasing the button will cause all panels to display the listen labels assigned to the selectors. If the listen and talk labels are the same, then there will be no change. When this function is active the green LED next to the “Listen Labels” button will be lit. To exit this mode momentarily press and release the “Listen Labels” button again. The panel displays will return to their normal state and the green LED next to the “Listen Labels” button will be extinguished.

## **EXPANSION PANEL OPERATION**

Optional expansion panels provide additional selectors that operate the same way as a panel's selectors, including talk, listen, tally, and error indication. The XPL-12 expansion panel provides 12 additional selectors. The XPL-22 expansion panel provides 22 additional selectors. Each expansion panel offers illuminated 5-character labels for every key.

Only one rack unit (1RU) of a standard Electronics Industry Association equipment rack is required for each expansion panel. The panels' compact size makes them ideal for use in TV control rooms,

edit suites, mobile OB vans, and any other location where many talk/listen keys are necessary but space it at a premium.



# 2 INSTALLATION

## INTRODUCTION

This chapter covers the installation of the ICS-92/92T and ICS-52/52T intercom panels. It also describes panel adjustments available for:

- Headset sidetone
- Panel microphone gain
- Speaker mute
- Page volume level
- Panel-to-matrix card baud rate

## DESCRIPTION

Installation of the ICS-92/92T and ICS-52/52T, including options such as expansion key panels, are identical to the ICS-2003 except for the following:

- Digital wiring for the ICS-92T and ICS-52T
- Mains AC power
- No front-panel adjustment of local program input
- Physical size
- No “Second Ear” output

## WIRING

### DIGITAL MATRIX FRAME TO PANEL WIRING

The ICS-92T and ICS-52T differ from the ICS-92 and ICS-52 because they include a digital audio/data communications module (COM-20) that works in conjunction with the DIG-2 digital interface module to connect the digital panel to the matrix frame.

The DIG-2 digital interface module offers two options for wiring the frame to intercom panels. One option is a single pair of double-shielded (braid and foil) 24 AWG conductor CAT-6 Enhanced STP cable with RJ-45 connectors.

The second option, available because only one pair is required, is 75-ohm (RG59) braid-shielded coax cable. For this option, a BNC-16 adaptor is required.

In addition, each panel may require other connector wiring, depending on the options and accessories that are installed.

For more information on the DIG-2 digital interface and the DIF-102 frame which houses it, refer to the *DIG-2/DIF-102 Digital Interface and Frame Instruction Manual* in the Eclipse set of manuals.

### Single-Pair Digital

Single-pair digital wiring requires double-shielded 24 AWG conductor CAT-6E enhanced STP cable.

Pair 1 transmits and receives multiplexed digital and analog between the matrix port and the panel.

**Note:** Ensure that the Select switch on the panel's rear panel is in the correct position for the intended use.

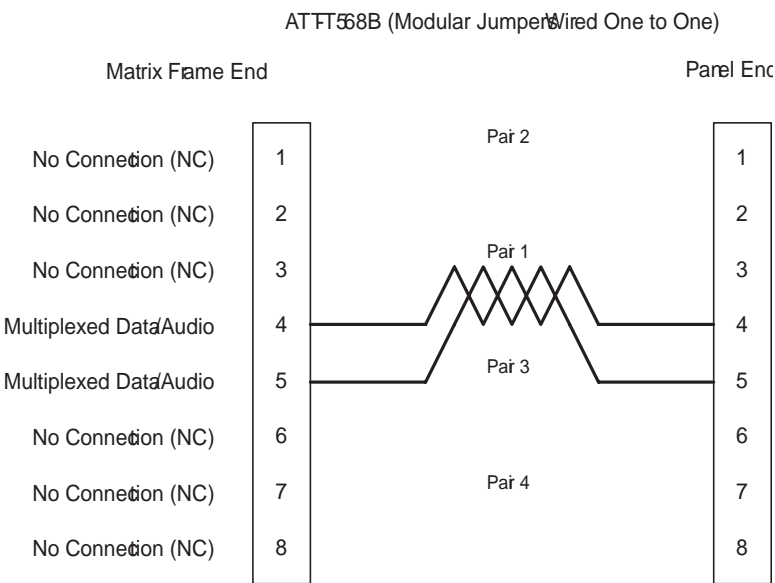


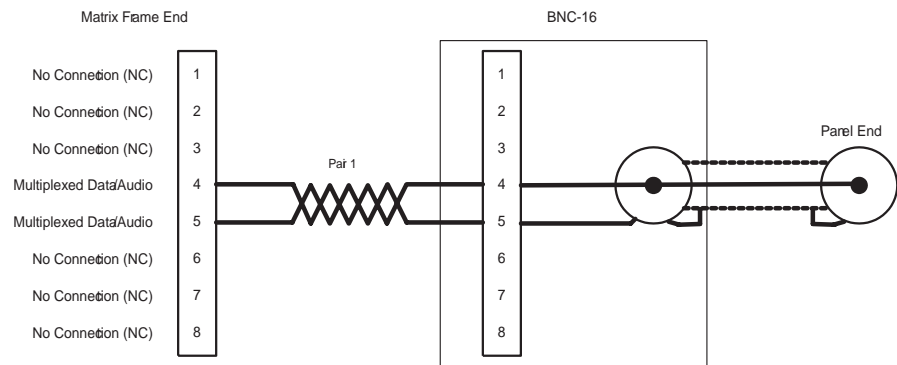
Figure 2-1: Matrix Frame to Digital Panel Wiring Using RJ-45

### Coax Digital

Coax digital wiring requires double-shielded 24 AWG conductor CAT-6 Enhanced STP cable connected to a 75-Ohm (RG59) braid-shielded coax cable with a BNC-16 adaptor.

Pair 1 transmits and receives multiplexed digital and analog between the matrix port and the panel.

**Note:** Ensure that the Select switch on the panel's rear panel is in the correct position for the intended use.



*Figure 2-2: Matrix Frame to Digital Panel Wiring Using BNC-16 and Coax*

## MAIN AC POWER

The ICS-52/52T and ICS-92/92T panels can be powered by any source that can supply between 12 and 16 V RMS AC at 750 mA. The panels are shipped with a wall-mounted transformer that provides 14 V RMS AC to the panel. Two types of transformer are available: one operates on a mains AC input power of 117 V (part number 730166) and the other operates on a mains AC input power of 220 V (part number 820049). Make sure to specify the proper transformer when ordering the panel.

To connect the transformer, route the cord from the transformer's secondary to the panel's "AC Power Input" connector on the rear panel. This is a 2.1 mm coax connector. When routing the cord make sure to use the stress relief on the rear panel.

The power input to the panel is internally protected with a 0.9 ampere "poly fuse," a self-healing fuse that will recover when the fault is removed.

## ADJUSTMENTS

The following panel parameters are adjustable either internally on the panel's main PCB, or externally by selecting options in the configuration program:

- Headset sidetone (main PCB)
- Panel microphone gain (main PCB)
- Speaker mute (configuration program)
- Page volume level (configuration program)
- Panel-to-matrix card baud rate (configuration program)

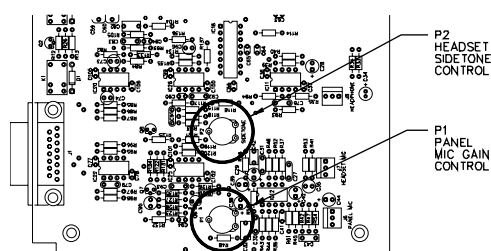
All these parameters are set to factory defaults. Most panels should operate at these default settings; however, some applications may require readjustment.

## HEADSET SIDETONE

Sidetone is the sound of the user's voice in his headset.

To adjust sidetone:

1. Remove the panel cover.
2. Find the sidetone control (marked "P2 Sidetone") on the main PCB. See Figure 3.
3. Connect a headset to the panel.
4. While speaking into the headset microphone, use a small screwdriver to turn the sidetone control until the sidetone is at the desired level.
5. Re-install the panel cover.



*Figure 2-3: Sidetone and Panel Microphone Gain Adjustment Controls*

## PANEL MICROPHONE GAIN

You can adjust the preamplifier gain of the panel microphone over a range of 0 to 10 dB; the maximum is the panel microphone gain's default setting. However, if two panels are talking to each other at the same time with the panel microphone gain set to maximum, feedback may occur even if the speaker mute (see the "Speaker Mute" section, next) is set to maximum. In this case, it will be necessary to turn the panel microphone gain down. Similarly, in some noisy environments it may be necessary to turn the panel microphone gain down and have the operator talk more closely into the microphone.

To adjust the panel microphone gain:

1. Remove the panel cover.
2. Use a small screwdriver to adjust the control marked "P1" on the Main PCB. See Figure 3.
3. Reinstall the panel's cover.

## SPEAKER MUTE

When a panel microphone and a speaker are used together, feedback is possible. To reduce this possibility, the panel software will mute (turn down) the speaker level by some predetermined amount when both the microphone and speaker are enabled. The speaker mute can be adjusted from 0 to 15 dB; its default setting is 6 dB.

Refer to the *Eclipse Configuration System Instruction Manual* for instructions on muting the speaker.

## PAGE VOLUME LEVEL

When Page Override is assigned to a label, the audio level at the destination panel(s) is predetermined. This function allows talking to someone even if his panel's volume control is off. Two things will happen when a panel activates such a label:

- If the destination speaker was off, it will turn on.
- The panel(s)'s speaker output will be at the predetermined level regardless of the "Intercom" volume control setting, unless this control is set higher than the predetermined level.

The page volume level can be adjusted within a range of 0 to 10, equivalent to the front-panel control settings of 0 equals off and 10 equals full pot. The page volume level's default setting is 5.

Refer to the *Eclipse Configuration System Instruction Manual* for instructions on using Page Override.

## PANEL-TO-MATRIX CARD BAUD RATE

The RS-422 serial data communication between a panel and other devices can operate at standard (19.2 k baud, the default) and long-line (9600 baud) baud rates. Use long-line only if encountering problems with the standard baud rate.

The baud rate is set from the configuration program and the panel automatically adapts.



# 3

# MAINTENANCE

## INTRODUCTION

This section provides panel microprocessor resetting instructions, troubleshooting guidelines, schematics, assembly drawings, and component lists for the ISC-92 and ICS-52 intercom panels and the ICS-92T and ICS-52T digital intercom panels. For information on XPL Accessory Panels, the OPT-100, and the COM-1 communications module, see the *ICS-2003 Intercom Panel Instruction Manual*.

These panels operate at 14 VAC, supplied from an external transformer. Transformers can be ordered for either 117 VAC or 220 VAC.

## PANEL RESET

The panel's microprocessor has a reset button located in an unmarked hole just below the "Listen Labels" button on the right side of the unit's front panel. If the panel is acting erratically, try resetting it by doing one of the following:

- Inserting a small screwdriver or a stiff piece of wire (such as a bent paper clip) into the hole and pushing the reset button.
- Unplugging the panel from AC power and reconnecting.

## TROUBLESHOOTING

When experiencing the symptoms listed below, attempt the following solutions in the order outlined. The solutions are listed in order of difficulty with the first being the most simple and easy. For troubleshooting guidelines for the entire system, see the Overview chapter of this manual.

- The panel's LEDs and push-button lights fail to light.
  1. Check mains AC power into the panel.
  2. Ensure the external power supply is properly connected to the panel.
  3. Replace the panel.
- The LED indicator above a selector key does not light when the key is pressed.
  1. Ensure the selector key has a label assigned to it (the LED indicator will not light without an assigned label).
  2. Reset the panel.
  3. Replace the panel.

- The panel appears to activate talk paths, but other panels can't hear the panel operator.
  1. Check Mic On/Off and Panel Mic buttons to ensure the intended microphone is selected and on.
  2. If the correct microphone is turned on, ensure the panel audio has not been muted externally through the logic inputs.
  3. Make sure the panel has not been defined as a nearby panel.
  4. Enable Eavesdropping on the panel.
  5. Test the integrity of the panel's audio path by temporarily setting a forced listen to it.
  6. Reset the panel.
  7. Replace the panel.
- The panel is inoperative and all red LEDs flash slowly.
  1. Wait 60 seconds If the matrix frame has just been powered up, it is possible it is still downloading the configuration to the Matrix cards.
  2. Ensure the cable connecting the panel to the matrix is plugged in at both ends.
  3. Check the integrity of the data paths, especially the polarity for panels using a COM-10 communication module.
  4. Check the configuration program to ensure the panel has been assigned the correct port type.
  5. Confirm the matrix card type matches the panel. Panels with COM-10 communication modules should have an MTX-A8 or MVX-A8. Panels with COM-20 communication modules should have an MTX-D8 or MVX-D8.
  6. Reset the panel's matrix card in the Matrix frame.
  7. Replace the panel's matrix card in the Matrix frame.
  8. Reset the panel.
  9. Replace the panel.
- No audio from the panel's speaker.
  1. Ensure the 'Intercom' knob on the panel's front panel is turned up.
  2. Ensure the "Speaker On/Off" button is on.
  3. Check whether audio can be heard in a headphone.
  4. Check the configuration program and the panel's logic inputs to ensure the speaker has not been software disabled.
  5. Test the integrity of the panel's audio path by temporarily setting a forced listen to it.
  6. Reset the panel's Matrix card in the Matrix frame.
  7. Replace the panel's Matrix card in the Matrix frame.
  8. Reset the panel.
  9. Replace the panel.



- The operator cannot hear another panel's page or call signal tones.
  1. Adjust the "Page Volume" control of the panel using the configuration program (refer to the *PGM-WIN System Configuration Manual*).
  2. Check the panel's configuration to see if page override is enabled.
- Announce tones (eavesdropping indication, change tones, etc.) aren't heard at the panel.
  1. Check the panel's Configuration menu to see if the monitoring tones and change tones are enabled.
- Accessory panel keys do not function.
  1. Check the accessory panel's connection on the panel's rear panel.
  2. Ensure the external AC power transformers are correctly connected to the accessory panels.
  3. Check the configuration program to ensure the correct number of keys are configured.

## BILL OF MATERIALS

### MISCELLANEOUS

Device	Description	Part #
CABLE	10-PIN FLAT CABLE	770011
CABLE	16-PIN FLAT CABLE (SPLIT	770010
CABLE	34-PIN FLAT CABLE	730181
CLAMP	CABLE CLAMP, 3/16IN PLASTIC	640054
FLASH ROM	ICS-92 PROGRAM	710414
SPEAKER	41 X 71MM, SMALL MAGNET	500138
TRANSFORMER	POWER PLUG-IN 117/14VAC	400008
TRANSFORMER	POWER PLUG-IN 220/14VAC	400011

# ICS-92/52 DIGITAL BLOCK DIAGRAM

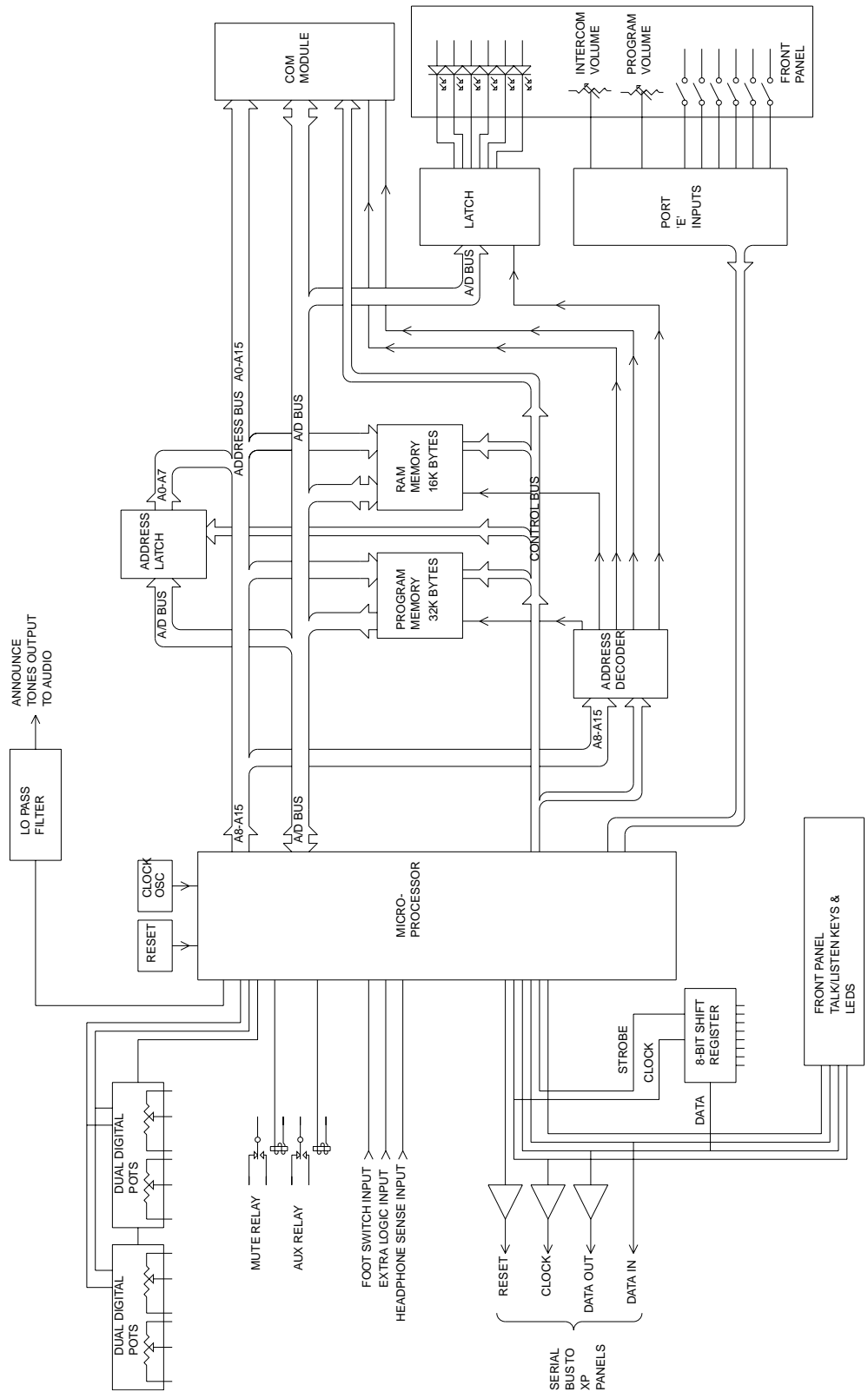
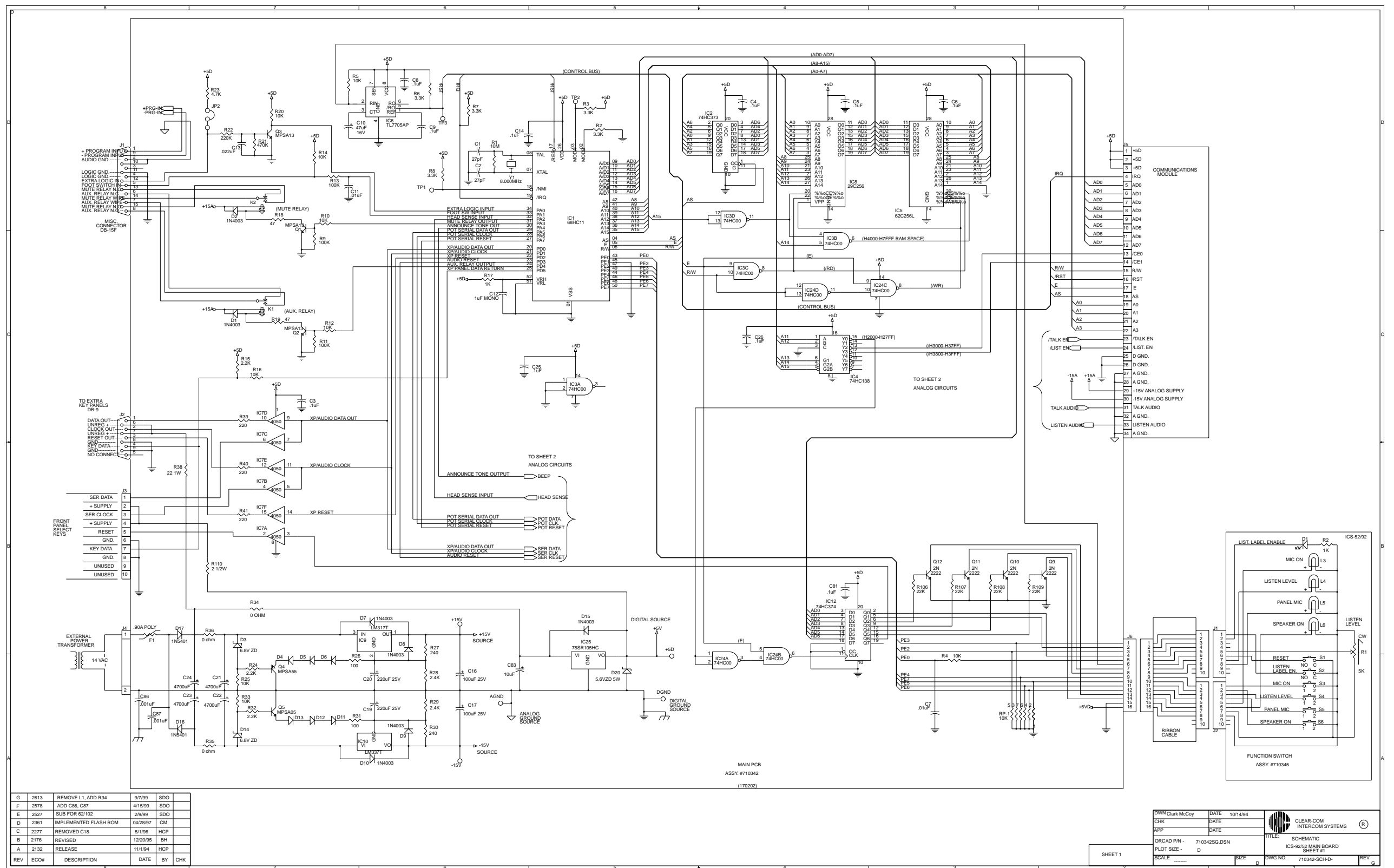


Figure 3-4: Digital Block Diagram—ICS-92/92T/ICS-52/52T Main PCB





# ICS-92/52 AUDIO BLOCK DIAGRAM

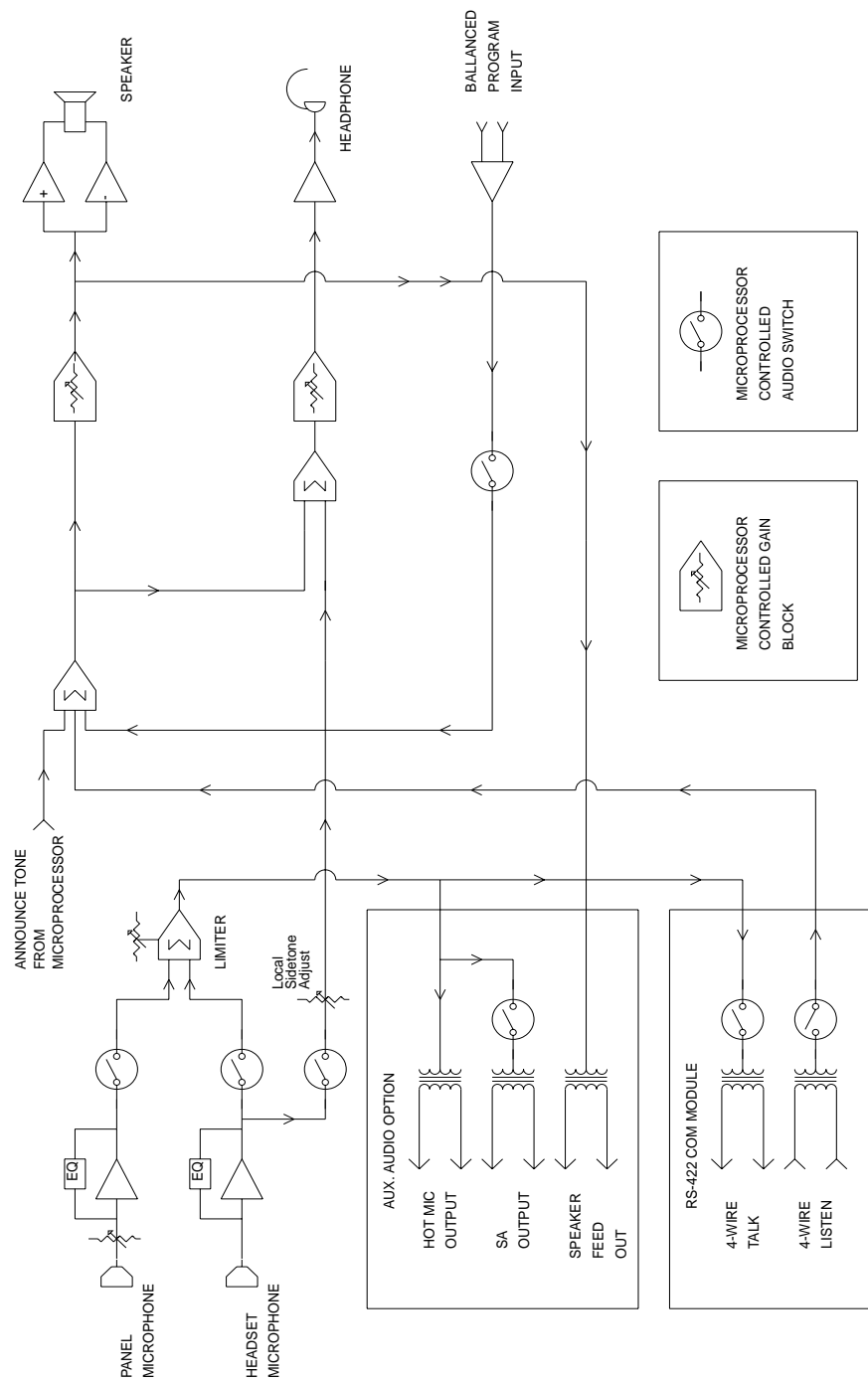


Figure 3-6: Audio Block Diagram—ICS-92/ICS-52 Main PCB





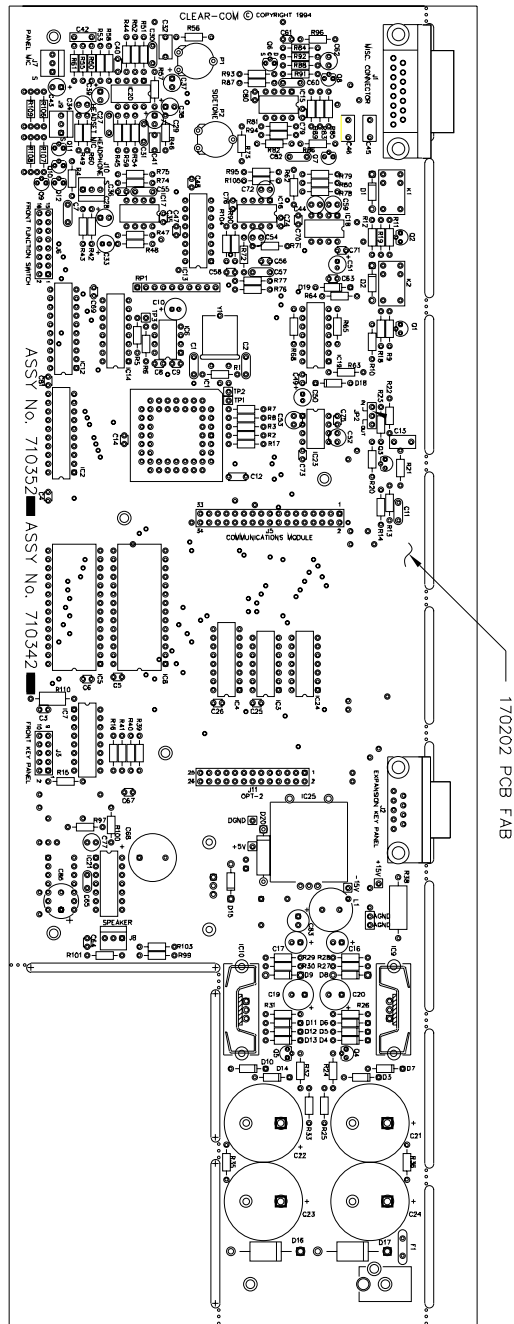


Figure 3-8: Assembly Drawing—ICS-92/92T/ICS-52/52T Main PCB Rev. E



## BILL OF MATERIALS FOR ICS-92/92T MAIN PCB

### CAPACITORS

Value	Type		Volts	Tol.	Part #	Designator
27	PF	CERAMIC	50	5%	150071	C1 C2
47	PF	CERAMIC	50	10%	150041	C55
100	PF	CERAMIC	50	10%	150006	C44 C52 C53 C54 C59 C72
200	PF	CERAMIC	100	5%	150063	C60 C82
6800	PF	CERAMIC	50	5%	150057	C41
001	UF	CERAMIC	30	20%	150052	C65 C66
0022	UF	MYLAR	100	5%	150045	C30 C31 C40
0047	UF	MYLAR	50	5%	150114	C32
0047	UF	CERAMIC	50	10%	150016	C57
01	UF	CERAMIC	30	20%	150012	C7 C11 C27
022	UF	MYLAR	100	10%	150008	C13
047	UF	MONO	50	10%	150111	C56
1	UF	MONO	50	10%	150035	C9 C14 C25 C26 C35 C36 C47 C48 C49 C58 C61 C63 C3 C4 C5 C6 C8 C76 C79 C80 C81 C64 C67 C69 C70 C71 C73 C74 C75
1	UF	MONO	100	10%	150085	C42
22	UF	MYLAR	100	20%	150003	C45 C46
1	UF	CERAMIC	50	10%	150073	C12 C18
1	UF	ALUMINUM NP50		10%	150002	C3 C62 C77 C78
2.2	UF	ALUMINUM NP50			150065	C33
22	UF	TANT.	16		150032	C38 C39
22	UF	ALUMINUM	16	20%	150142	C28 C29 C37 C43 C50 C51
33	UF	ALU LOW ESR35		20%	150130	C84 C83
47	UF	ALUMINUM	16	20%	150143	C10
100	UF	ALUMINUM	25	20%	150099	C16 C17
220	UF	ALUMINUM	25		150137	C19 C20
1000	UF	ALUMINUM	35		150092	C68
4700	UF	ALUMINUM	25		150139	C21 C22 C23 C24

## RESISTORS & RESISTOR PACKS

Value	Power	Type	Tol.	Part #	Designator
1	OHM	1/4W CARBON FILM	5%	410139	R99 R103
2.2	OHMS	1/4W CARBON FILM	5%	410113	R101
22	OHMS	1/4W CARBON FILM	5%	410004	R47 R48
22	OHMS	1W CARBON FILM	5%	410174	R38
47	OHMS	1/4W CARBON FILM	5%	410039	R18 R19 R57 R58
82	OHMS	1/4W CARBON FILM	5%	410038	R46
100	OHMS	1/4W CARBON FILM	5%	410071	R26 R31 R45 R56
220	OHMS	1/4W CARBON FILM	5%	410007	R39 R40 R41 R44
240	OHMS	1/4W CARBON FILM	5%	410060	R27 R30
5	OHMS	TRIM POT		470060	P1
1K	OHMS	1/4W CARBON FILM	5%	410010	R17 R60
1.2	OHMS	1/4W CARBON FILM	5%	410041	R88
2.2K	OHMS	1/4W CARBON FILM	5%	410011	R15 R24
R32					
2.4K	OHMS	1/4W CARBON FILM	5%	410103	R28 R29
2.7K	OHMS	1/4W CARBON FILM	5%	410040	R63 R64
3.0K	OHMS	1/4W CARBON FILM	5%	410104	R73
3.3K	OHMS	1/4W CARBON FILM	5%	410015	R2 R3 R6 R7 R8 R85 R86
4.02K	OHMS	1/8W METAL FILM	1%	410155	R51 R52 R53 R54 R59
4.7K	OHMS	1/4W CARBON FILM	5%	410013	R23 R61
R76					
5K	OHMS	TRIM POT		470022	P2
8.2K	OHMS	1/4W CARBON FILM	5%	410037	R100 R102
10K	OHMS	1/4W CARBON FILM	5%	410016	R4 R5 R10 R12 R14 R16 R20 R25 R33 R55 R65 R68 R71 R81 R82 R83 R87 R90 R93 R94 R95 R104 R105
1	OHM X 9	R-PACK		415001	RP1
15K	OHMS	1/4W CARBON FILM	5%	410017	R43
22K	OHMS	1/4W CARBON FILM	5%	410018	R42 R50 R77 R97 R98 R106 R107 R108 R109

24K	OHMS 1/4W	CARBON FILM	5%	410083	R91
33K	OHMS 1/4W	CARBON FILM	5%	410020	R75
39.2K	OHMS 1/8W	METAL FILM	1%	410111	R62 R78 R79 R80
47K	OHMS 1/4W	CARBON FILM	5%	410021	R49
56K	OHMS 1/4W	CARBON FILM	5%	410023	R92
100K	OHMS 1/4W	CARBON FILM	5%	410024	R9 R11 R13
150K	OHMS 1/4W	CARBON FILM	5%	410026	R72 R74
220K	OHMS 1/4W	CARBON FILM	5%	410028	R22
470K	OHMS 1/4W	CARBON FILM	5%	410030	R21 R84
1M	OHM 1/4W	CARBON FILM	5%	410058	R96
2.2M	OHMS 1/4W	CARBON FILM	5%	410153	R89
10M	OHMS 1/4W	CARBON FILM	5%	410059	R1

### DIODES AND TRANSISTORS

Device	Description	Part #	Designator
DIODE	1N957B ZENER 6.8V .4W 5%	480026	D3 D14
DIODE	1N4003 RECT 1A 200PIV	480058	D1 D2 D7 D8 D9 D10 D15
DIODE	1N4148 SIGNAL 10MA 75PIV	480000	D4 D5 D6 D11 D12 D13
DIODE	1N5231B ZENER 5.1V .5W 5%	480038	D18 D19
DIODE	1N5339 ZENER 5.6V 5W	480182	D20
DIODE	1N5401 RECT 3A 100PIV	480005	D16 D17
TRANSISTOR	2N2222 NPN 30V	480006	Q7 Q8 Q9 Q10 Q11 Q12
TRANSISTOR	J174 JFET PCHAN 8V VGS	480079	Q6
TRANSISTOR	RMPS-A05 NPN 60V	480052	Q5
TRANSISTOR	RMPS-A13 NPN 30V DARL	480004	Q1 Q2 Q3
TRANSISTOR	RMPS-A55 PNP 60V	480050	Q4

### INTEGRATED CIRCUITS

Device	Description	Part #	Designator
4050B	CMOS HEX BUFFER	480077	IC7
4094B	CMOS 8 BIT SHIFT REGISTER	480107	IC14
68HC11A	CMOS MCU 52 PIN PLCC FP	480132	IC1
4HC00	CMOS QUAD NAND	480157	IC3 IC24
74HC138	CMOS 3 TO 8 LINE DECODER	480120	IC4
74HC373	CMOS OCTAL D LATCH	480142	IC2
74HC374	CMOS OCTAL D FL/FLOP	480143	IC12
DG211CJ	CMOS QUAD ANALOG SWITCH	480092	IC13
GM76C256L	CMOS SRAM 32K X 8 100NS	480183	IC5
DS1267-10	DIGITAL POT, DUAL 10K	480195	IC19
LM384	OPAMP, POWER 4W	480012	IC21 IC22
LM833N	OPAMP, DUAL LO NOISE	480175	IC20
NE5532	OPAMP, DUAL LO NOISE	480070	IC15 IC16 IC17 IC18

78SR105HC REGULATOR, 5V SWITCHER 1A	480206	IC23
LM317T REGULATOR, POS ADJ 1.5A	480167	IC25
LM337T REGULATOR, NEG ADJ 1.5A	480177	IC9
TL7705AP RESET SUPERVISOR IC	480177	IC10
	480134	IC6

#### MISCELLANEOUS

Device	Description	Part #	Designator
CONNECTOR	2.1MM CO-AX PC MTG POWER	210213	J4
CONNECTOR	DB-9F RT ANG PC MTG	210186	J2
CONNECTOR	DB-15F RT ANG PC MTG	210187	J1
CRYSTAL	8.000MHZ PARALLEL CRYSTAL	230003	Y1
FUSE	0.90A POLY SWITCH	520036	F1
JUMP JACK	JUMP JAX	210103	JP2
RELAY	SPDT 12V PC RELAY ITT#SZ12	450006	K1 K2



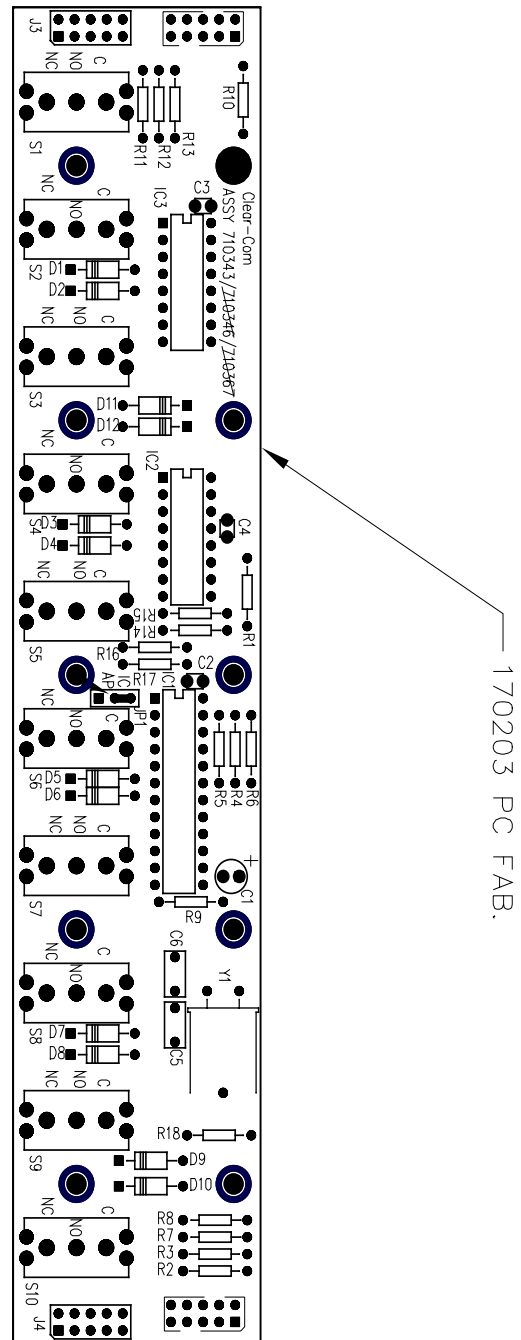


Figure 3-10: Assembly Drawing—ICS-92/92T Selector Switch PCB Rev. D

## BILL OF MATERIALS FOR ICS-92/92T SELECTOR SWITCH PCB

### CAPACITORS

Value	Type	Volts	Tol.	Part #	Designator
22 PF	CERAMIC	50	10%	150098	C5 C6
1 UF	MONO	50	10%	150035	C2 C3 C4
10 UF	ALUMINUM	50		150064	C1

### RESISTORS & RESISTOR PACKS

Value	Power	Type	Tol.	Part #	Designator
0	OHM	JUMPER		600000	R18
1	OHMS 1/4W	CARBON FILM	5%	410071	R1 R2 R3 R7 R8
200	OHMS 1/4W	CARBON FILM	5%	410072	R10 R11 R12 R13
4.7K	OHMS 1/4W	CARBON FILM	5%	410013	R14 R15 R16 R17
8.2K	OHMS 1/4W	CARBON FILM	5%	410037	R9
100K	OHMS 1/4W	CARBON FILM	5%	410024	R4 R5 R6

### DIODES AND TRANSISTORS

Device	Description	Part #	Designator
DIODE	1N4148 SIGNAL 10MA 75PIV	480000	D1 D2 D3 D4 D5 D6 D7 D8 D9 D10

### INTEGRATED CIRCUITS

Device	Description	Part #	Designator
710353	PROGRAMED MICRO P87C751	710353	IC1
UCN5821	ACMOS 8 BIT SHFT REG I SINK	480164	IC2
UCN5895	CMOS 8 BIT SHFT REG I SOURCE	480210	IC3

### MISCELLANEOUS

Device	Description	Part #	Designator
CRYSTAL	8.000MHZ PARALLEL HC-49U	230003	Y1
SWITCH	SP3T MOM-OFF-MOM PC MTG	510080	S1-S10

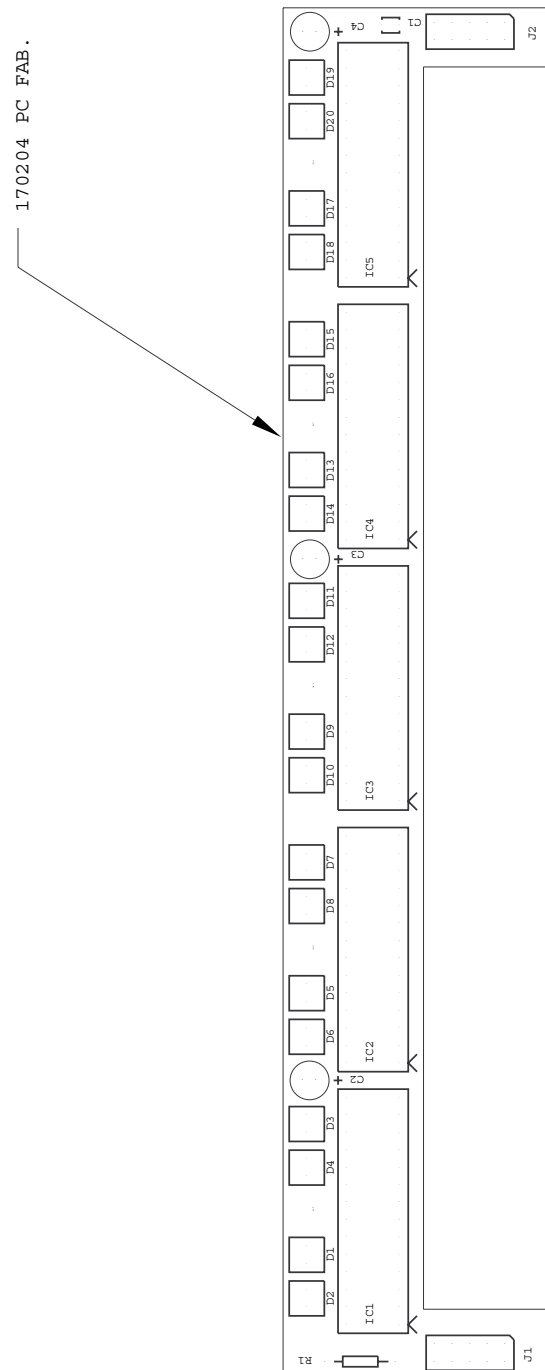


Figure 3-11: Assembly Drawing—ICS-92/92T Display PCB Rev. A



## BILL OF MATERIALS FOR ICS-92/92T DISPLAY PCB

### CAPACITORS

Value	Type	Volts	Tol.	Part #	Designator
.1	UF MON	50	10%	150035	C1
22	UF TAN	16		150032	C2 C3 C4

### RESISTORS & RESISTOR PACKS

Value	Power	Type	Tol.	Part #	Designator
100K OHMS	1/4W	CARBON FILM	5%	410024	R1

### DIODES AND TRANSISTORS

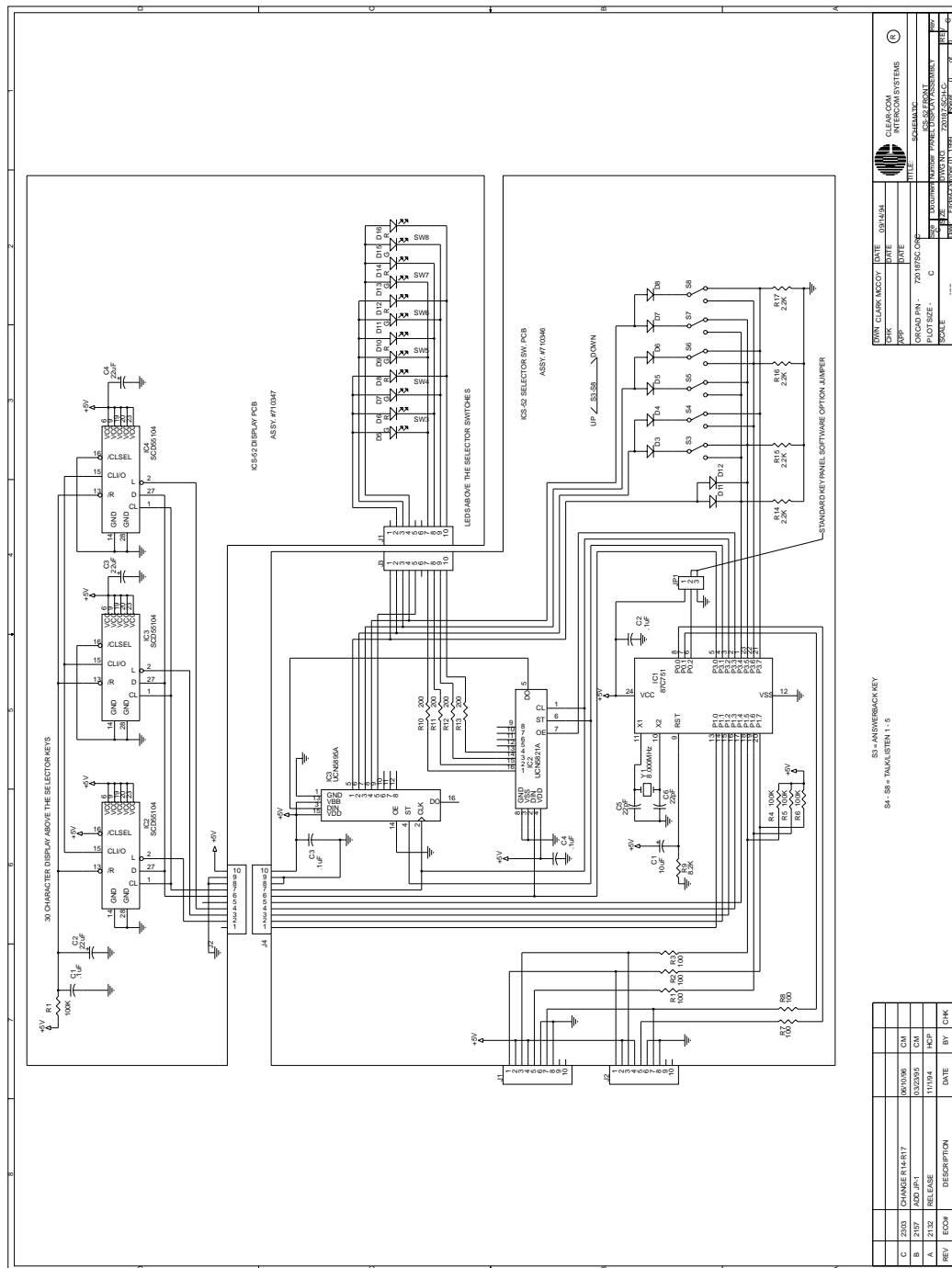
Device	Description	Part #	Designator
LED	GREEN, ROUND, FLAT TOP LED	390045	D1 D3 D5 D7 D9 D11 D13 D15 D17 D19
LED	RED, ROUND, FLAT TOP LED	390044	D2 D4 D6 D8 D10 D12 D14 D16 D18 D20

### INTEGRATED CIRCUITS

Device	Description	Part #	Designator
DISPLAY	10 CHARACTER LED DISPLAY	390050	IC1 IC2 IC3 IC4 IC5

### MISCELLANEOUS

Device	Description	Part #	Designator
LENS	TWO COLOR DISPLAY LENS	250694	



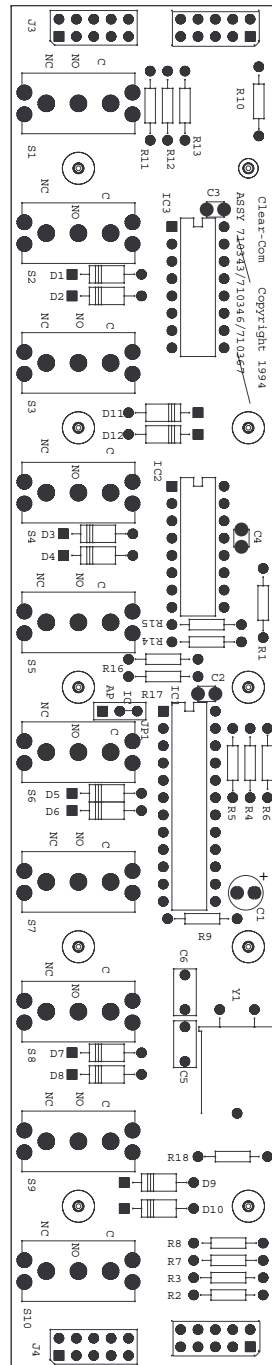


Figure 3-13: Assembly drawing—ICS-52/52T Selector Switch PCB Rev. C

## BILL OF MATERIALS FOR ICS-52/52T SELECTOR SWITCH PCB

### CAPACITORS

Value	Type	Volts	Tol.	Part #	Designator
22PF	CERAMIC	50	10%	150098	C5 C6
1UF	MONO	50	10%	150035	C2 C3 C4
10UF	ALUMINUM	50		150064	C1

### RESISTORS & RESISTOR PACKS

Value	Power	Type	Tol.	Part #	Designator
0	OHM	JUMPER		600000	R18
00	OHMS 1/4W	CARBON FILM	5%	410071	R1 R2 R3 R7 R8
200	OHMS 1/4W	CARBON FILM	5%	410072	R10 R11 R12 R13
4.7	OHMS 1/4W	CARBON FILM	5%	410013	R14 R15 R16 R17
8.2K	OHMS 1/4W	CARBON FILM	5%	410037	R9
100K	OHMS 1/4W	CARBON FILM	5%	410024	R4 R5 R6

### DIODES AND TRANSISTORS

Device	Description	Part #	Designator
DIODE	1N4148 SIGNAL 10MA 75PIV	480000	D3 D4 D5 D6 D7 D8

### INTEGRATED CIRCUITS

Device	Description	Part #	Designator
710353	PROGRAMED MICRO P,87C751	710353	IC1
UCN5821A	CMOS 8 BIT SHFT REG I SINK	480164	IC2
UCN5895	CMOS 8 BIT SHFT REG I SOURCE	480210	IC3

### MISCELLANEOUS

Device	Description	Part #	Designator
CRYSTAL	8.000MHZ PARALLEL HC-49U	230003	Y1
SWITCH	SP3T MOM-OFF-MOM PC MTG	510080	S3-S8

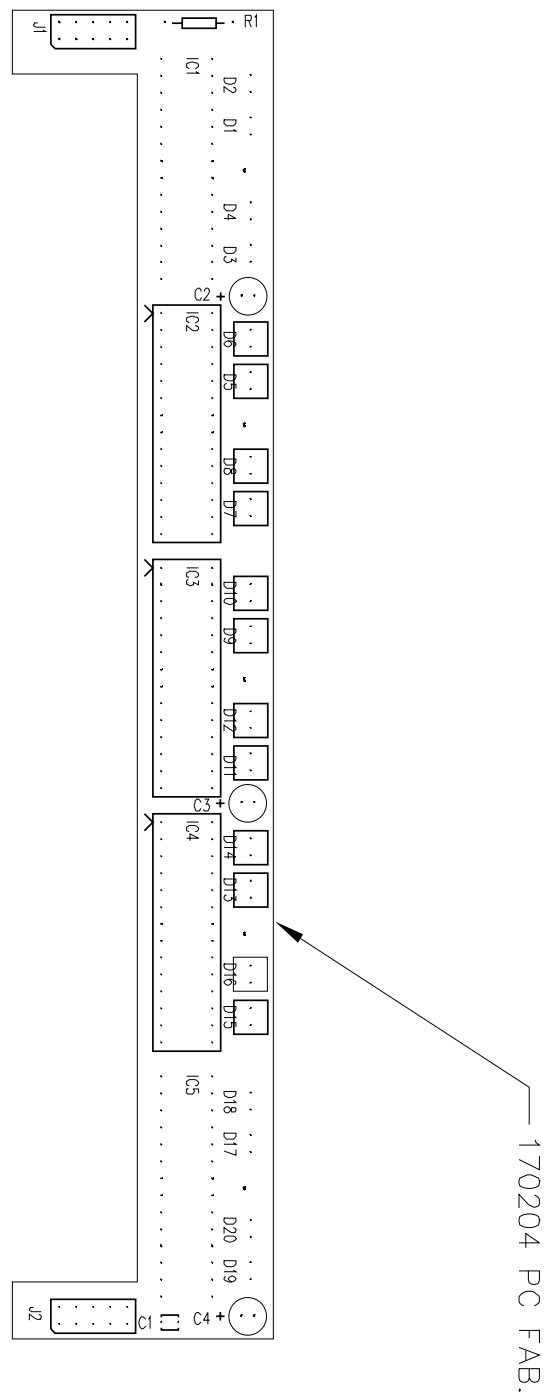


Figure 3-14: Assembly Drawing—ICS-52/52T Selector Switch LED PCB Rev. A

## BILL OF MATERIALS FOR ICS-52/52T DISPLAY PCB

### CAPACITORS

Value	Type	Volts	Tol.	Part #	Designator
.1UF	MON	50	10%	150035	C1
22UF	TAN	16		150032	C2 C3 C4

### RESISTORS & RESISTOR PACKS

Value	Power	Type	Tol.	Part #	Designator
100K	OHMS 1/4W	CARBON FILM	5%	410024	R1

### DIODES AND TRANSISTORS

Device	Description	Part #	Designator
LED	GREEN, ROUND, FLAT TOP LED	390045	D5 D7 D9 D11 D13 D15
LED	RED, ROUND, FLAT TOP LED	390044	D6 D8 D10 D12 D14 D16

### INTEGRATED CIRCUITS

Device	Description	Part #	Designator
DISPLAY	10 CHARACTER LED DISPLAY	390050	IC2 IC3 IC4

### MISCELLANEOUS

Device	Description	Part #	Designator
LENS	TWO COLOR DISPLAY LENS	250694	

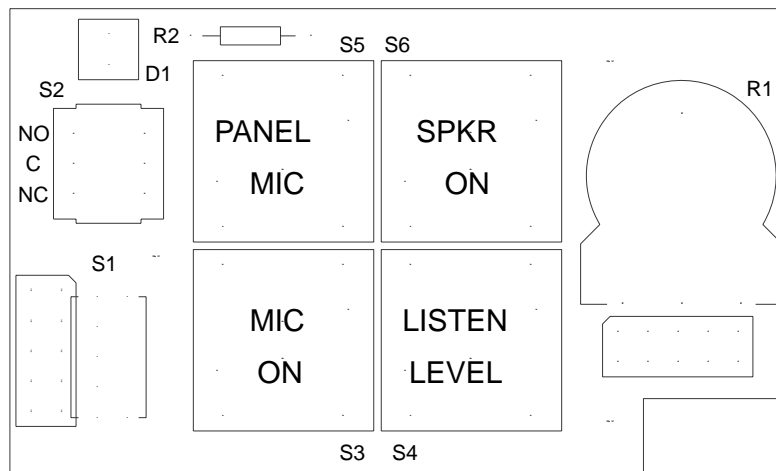


Figure 3-15: Assembly Drawing—ICS-92/92T Function Switch PCB Rev. C

## BILL OF MATERIALS FOR ICS-92/ICS-92T FUNCTION SWITCH PCB

### RESISTORS & RESISTOR PACKS

Value	Power	Type	Tol.	Part #	Designator
1K	OHMS 1/4W	CARBON FILM	5%	410010	R2
5K	OHMS	POT PC MOUNT		470072	R1

### DIODES AND TRANSISTORS

Device	Description	Part #	Designator
LED	GREEN, ROUND, FLAT TOP	390045	D1

### MISCELLANEOUS

Device	Description	Part #	Designator
SWITCH	PUSHBUTTON SWITCH	510089	S1
SWITCH	PUSHBUTTON, DPDT	510107	S2
SWITCH	PUSHBUTTON SWITCH W LAMP	510108	S3 S4 S5 S6

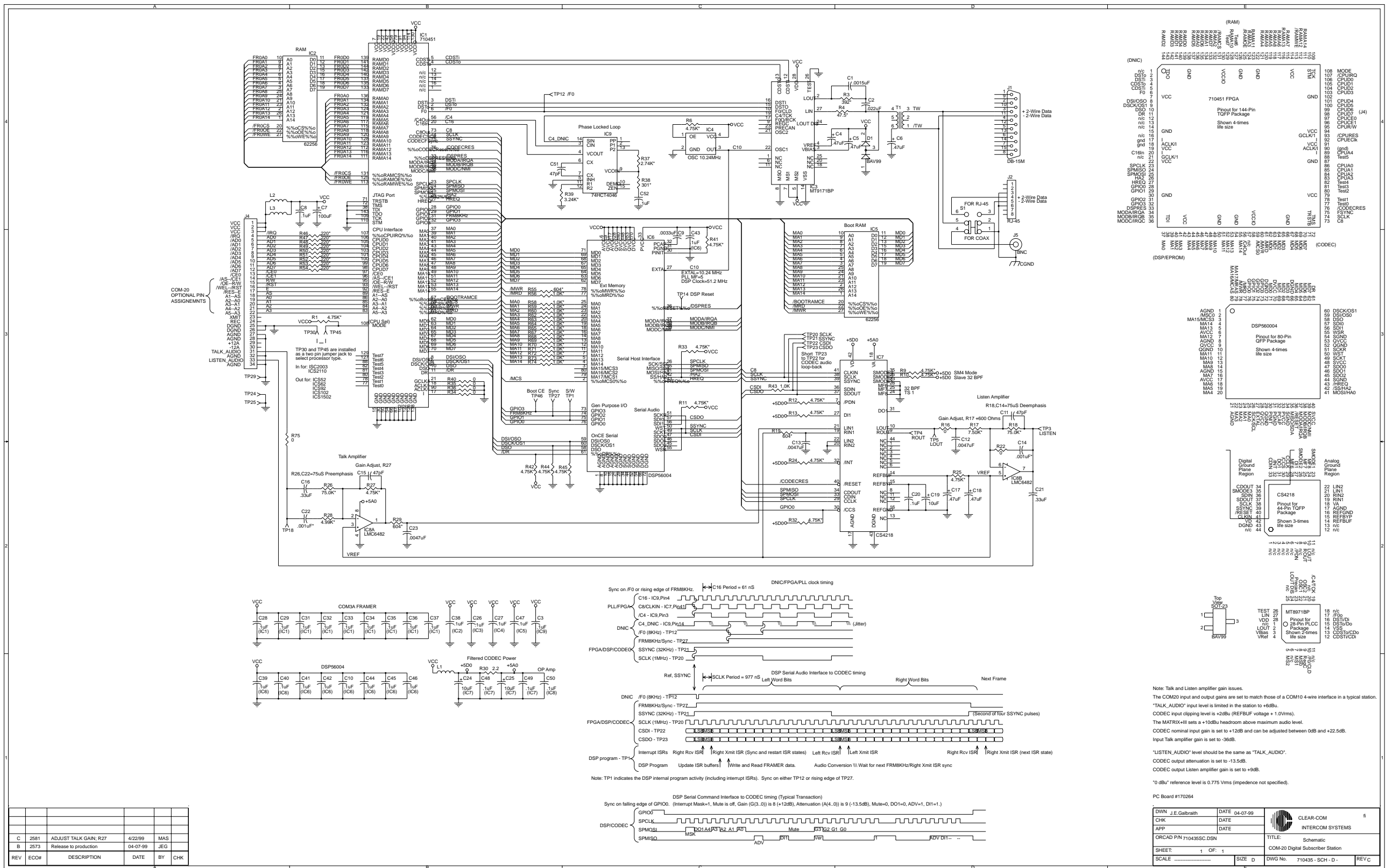


Figure 3-16: Schematic—COM-20 Communications PCB Rev. C



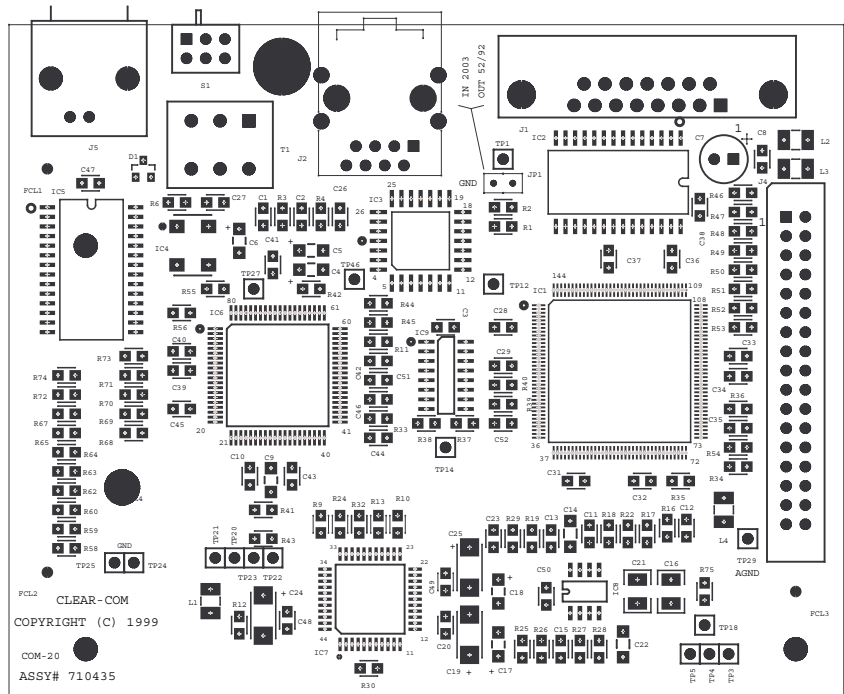


Figure 3-17: Assembly Drawing—COM-20 Communication PCB Rev. A

## BILL OF MATERIALS FOR COM-20 COMMUNICATION PCB

### CAPACITORS

Value	Type	Volts	Tol.	Part #	Designator
.001 uF	Ceramic Disc SMD50V	1%		151001	C14 C22
.00 33	Ceramic Disc SMD50V	5%		151002	C9
47 pF	Ceramic Disc SMD50V	5%		151120	C11 C15 C51
.0015uF	Ceramic Disc SMD50V	5%		151138	C1
.0047uF	Ceramic Disc SMD50V	10%		151156	C12 C13 C23
.022 uF	Ceramic Disc SMD50V	10%		151164	C2
.1 uF	Ceramic Disc SMD50V	10%		151172	C3 C8 C10
C20 C26					C27 C28 C29
C31 C32					C33 C34 C35
C36 C37					C38 C39 C40
C41 C42					C43 C44 C45
C46 C47					C48 C49 C50
C52					
.33 uF	Ceramic Disc SMD25V	10%		151178	C16 C21

.47	uF	Tantalum SMD35V	10%	151184	C4 C5 C6 C17
C18					
10	uF	Tantalum SMD25V	10%	151192	C19 C24 C25
100	uF	Aluminum 16V	20%	150155	C7

## RESISTORS

Value		Power	Type	Tol.	Part #	Designator
0	OHM	1/10	SMD		411100	R16 R22
R34 R35 R36						
						R40 R75
2.2	OHM	1/10	SMD	5%	411181	R30
47.5	OHM	1/10	SMD	1%	411262	R4
221	OHM	1/10	SMD	1%	411326	R46 R47
R48 R49 R50						
						R51 R52
R53 R54						
301	OHM	1/10	SMD	1%	411339	R38
392	OHM	1/10	SMD	1%	411350	R3
604	OHM	1/10	SMD	1%	411368	R29 R19
R55						
1.00K	OHM	1/10	SMD	1%	411389	R43 56 R58
R59 R60						
						R62
R63R64 R65 R67						
						R68 R70
R71 R72R73						
						R74 R69
2.74K	OHM	1/10	SMD	1%	411431	R37
3.24K	OHM	1/10	SMD	1%	411438	R39
4.75K	OHM	1/10	SMD	1%	411454	R1 R6 R9
R10 R11						
						R12 R13
R24 R25 R32						
4.75K	OHM	1/10	SMD	1%	411454	R33 R41
R42 R44 R45						
						R27
4.99K	OHM	1/10	SMD	1%	411456	R28
7.50K	OHM	1/10	SMD	1%	411473	R17
75.0K	OHM	1/10	SMD	1%	411569	R26 R18

## DIODES AND TRANSISTORS

Device	Description	Part #	Designator
Diode	BAV99 DUAL DIODE... SMD	481033	D1

## INTEGRATED CIRCUITS

Device	Description	Part #	Designator
62256	CMOS SRAM 32K X 8	481047	IC2 IC5
6482	DUAL CMOS OPAMP RAIL/RAIL	481022	IC8
0.24MHZ	CRYSTAL CLOCK OSCILLATOR	231004	IC4
4218	16-BIT 2 CHANNEL CODEC	481041	IC7
74HCT4046	ACMOS PHASE LOCK LOOP...SOIC16	481045	IC9

MT9171AP	DIGITAL NETWORK INT.	481046	IC3
56004	24-BIT DSP 40MHZ	481071	IC6
IFPGA	DNIC FRAMER, COM 20	710451	IC1

## MISCELLANEOUS

Device	Description	Part #	Designator
Connector	JUMP JAX	210103	JP1
Connector	HEADER MULTI PIN HEADER((PER)PIN)	210112	JP1(2)
Connector	15 PIN (M) RT ANG PC MTG D TYPE CON	210188	J1
Connector	DUAL ROW HEADER 17 POS. .230IN	210279	J4
Connector	RJ-45 RT ANG MOD CON 1-PORT SHIELDED	210335	J2
Connector	BNC RT ANGLE PC MNT W/THREAD BUSH	210354	J5
Inductor	FERRITE EMI SUPPRESSOR 400MA 181001	L1 L2 L3	
Switch	DPDT MICRO-SUBMINIATURE SWITCH	510124	S1
Transformer	2745B 2:1 PULSE TRANSFORMER	560023	T1

# 4 SPECIFICATIONS

0 dBv is referenced to 0.775 V RMS

## ICS-92/52 PANEL

### FRONT-PANEL CONTROLS AND CONNECTORS

Talk/Listen Switches:	9 (ICS-92, ICS-92T) 5 (ICS-52, ICS-52T)
Function Keys	4
Answer Back Switch	1
Volume Controls	1
Headset Connector	1 D4M XLR
Panel Mic Connector	1-1/4 inch Phone Jack

### REAR-PANEL CONNECTORS

Miscellaneous	DB-15F
To Matrix	DB-15M
Audio IO (OPT-100)	DB-15F

Accessory	DB-9F
AC Power	IEC-320

### PANEL MICROPHONE INPUT

Type:	Electret
Input Level	40 dBv
Impedance	200 Ohms

### HEADSET MICROPHONE INPUT

Type	Dynamic
Input Level	-55dBv
Gain Adjustment Range	+/- 5dB
Impedance	200 Ohms

### LOCAL PROGRAM INPUT

Type	Electronically Balanced
Impedance	8k Ohms Bridging
Level	0 dBv will produce full output of speaker when volume control is fully clockwise

### HEADPHONE OUTPUTS

Impedance	50 to 600 Ohms
Power	1/2 W into 50 Ohms

### SPEAKER AMPLIFIER OUTPUT

Impedance	8 Ohms
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Power	4 W
LINE INPUT (2 -PAIR LISTEN FROM MATRIX)	
Type	Transformer Balanced
Impedance	8k Ohms Bridging
Level	0 dBv nominal
Freq. Resp.	100 Hz to 15 kHz +/- 2 dB
LINE OUTPUT (2-PAIR TALK TO MATRIX)	
Type	Transformer Balanced
Impedance	150 Ohms (when talk active)
Level	0 dBv nominal
Freq. Resp.	100 Hz to 15 kHz, +/- 2 dB
LOGIC INPUT #1	
Type	5 V logic with pull-up resistor
Logic	True = Short to Ground
LOGIC INPUT #2	
Type (Option 1)	5 V logic with pull-up resistor
Logic (Option 1)	True = Short to Ground
Type (Option 2)	External Voltage Sense
Logic (Option 2)	Lo = 0 - +2 VDC, Hi = +4 - +30 VDC
MUTE RELAY	
Contact Type	1 pair SPDT (single form C)
Contact Voltage Rating	24 VDC
Contact Current Rating	1 Amp continuous, 2 Amps peak at 24 VDC
PANEL RELAY	
Contact Type	1 pair SPDT (single form C)
Contact Voltage Rating	24 VDC
Contact Current Rating	1 Amp continuous, 2 Amps peak at 24 VDC
POWER	
AC Input to Panel	Between 12 and 16 VAC at 750 mA Mains AC Power Input to Wall-Mount Transformer 16 W (150 mA at 115 VAC)
TEMPERATURE	
Operating	Between 0 and 50 C (32 to 125 F)
Storage	Between 0 and 70 C (32 to 150 F)
HUMIDITY	
Operation and Storage	Between 20% and 90%, Non-Condensing

## PACKAGE DIMENSIONS

Height	1.75 in. (44mm), 1 RU
Width	19.0 in. (483mm)
Depth	6.75 in. (171mm)
Weight	4.27 lbs. (2.0kg)

## OPT-100 AUXILIARY AUDIO I/O OPTION

### AUDIO

Output Signal Levels	0.0 dBv nominal
Impedance	600 Ohms, transformer balanced
Frequency Response	100 Hz to 10 kHz, +/- 2 dB of mic preamp or external program input
Distortion	Less than 0.5% THD

### SA RELAY

Contact Type	1 pair SPDT (single form C)
Contact Voltage Rating	24 VDC
Contact Current Rating	1 Amp continuous, 2 Amps peak at 24 VDC

## ACCESSORY PANELS

### XPL-12

Height	1.75 in. (44 mm), (1 RU)
Width	19.0 in. (483 mm)
Depth	2.50 in. (64 mm)
Weight	1.5 lbs. (0.7 kg)
Power	14 VAC, 0.5 Amps (120 VAC 770 mA wall-mount transformer supplied with unit. 220 VAC version available on special order)

### XPL-22

Height	1.75 in. (44 mm), (1 RU)
Width	19.0 in. (483 mm)
Depth	2.50 in. (64 mm)
Weight	1.8 lbs. (0.8 kg)
Power	14 V AC, 0.5 Amps (120 V AC 770 mA wall-mount transformer supplied with unit. 220 V AC version available on special order).

## Notice About Specifications

While Vitec Group Communications makes every attempt to maintain the accuracy of the information contained in its product manuals, that information is subject to change without notice. Performance specifications included in this manual are design-center specifications and are included for customer guidance and to facilitate system installation. Actual operating performance may vary.



# WARRANTY

Clear-Com guarantees this product to be free of manufacturing defects in material and workmanship under normal use for a period of two years from the date of purchase.

## TECHNICAL SUPPORT

To ensure complete and timely support to its customers, Clear-Com maintains Technical Service Centers (TSC) staffed by qualified technical personnel. A Technical Service Center is staffed to respond to all technical inquiries and to troubleshoot technical problems regarding all products supplied by Clear-Com. A TSC is fully available to Clear-Com's customers during the full course of their warranty period.

Instructions for reaching our Technical Service Centers are given below.

### **For technical support from Europe, the Middle East, and Africa**

Call: +49 40 66 88 40 40 Monday through Friday 09:00 – 17:00 (GMT)

+49 40 66 88 40 41 24hrs, any day (But you must have your PIN number ready.)

Web site: [www.clearcom.com](http://www.clearcom.com)

### **For technical support from the Americas and Asia**

Call: +1 510 337 6600

Web site: [www.clearcom.com](http://www.clearcom.com)

Email: [customerservicesUS@vitecgroup.com](mailto:customerservicesUS@vitecgroup.com)

FAX: +1 510 337 6699

## EXCEPTIONS

This warranty does not include damage to a product resulting from cause other than part defect and malfunction. The VGC warranty does not cover any defect, malfunction, or failure caused beyond the control of VGC, including unreasonable or negligent operation, abuse, accident, failure to follow instructions in the manual, defective or improperly associated equipment, attempts at modification and repair not approved by Clear-Com, and shipping damage. Products with their serial numbers removed or defaced are not covered by this warranty.

*Clear-Com offers 24/7 customer support.*

*Return authorization numbers are required for all returns.*

*Both warranty and non-warranty repairs are available.*

## **WARRANTY REPAIRS**

While Clear-Com will ensure complete system integrity by providing whatever support is necessary to resolve any failure covered under the terms of the warranty, the normal procedure will be to repair or replace any defective Line Replaceable Unit (LRU) that is returned to Clear-Com during the warranty period.

A Line Replaceable Unit (LRU) is defined as: an assembly that can be safely removed from the system and readily replaced by plugging in a new unit. In the case of ancillary items such as power supplies, the entire power supply would be returned. Whereas, in the case of circuit cards, control panels, etc., only these assemblies would be returned for repair. All equipment provided by Clear-Com is covered under the warranty.

This warranty does not include defects arising from installation (when not performed by Clear-Com), lightning, power outages and fluctuations, air conditioning failure, improper integration with non-approved components, defects or failures of customer furnished components resulting in damage to Clear-Com provided product.

## **NON-WARRANTY REPAIRS**

Equipment that is not under warranty must be sent prepaid to Clear-Com. If requested, an estimate of repair costs will be issued prior to service. Once repair is approved and completed, the equipment will be shipped freight collect from the TSC.

## **REPLACEMENT UNITS**

Should Clear-Com determine, in its reasonable discretion, that any part of a product is defective due to faulty materials or workmanship, Clear-Com shall at its expense, repair or replace such part and return the repaired/replacement part to the customer. The provisions of this warranty shall apply to the repaired/replacement part for the unexpired portion, if any, of the warranty period.

## **EMERGENCY ON-SITE ASSISTANCE**

Clear-Com can provide emergency on-site technical assistance in support of warranty activities. The level of support effort required will be decided on a case-by-case basis. Clear-Com has the qualified technical staff to support any and all emergency site activities should they occur.

## **LIABILITY**

The foregoing warranty is Clear-Com's sole and exclusive warranty. There are no other warranties (including without limitation warranties

for consumables and other supplies), or guarantees, expressed or implied (including, without limitation, any warranties of merchantability or fitness for a particular purpose), of any nature whatsoever, whether arising in contract, tort, negligence of any degree, strict liability or otherwise, with respect to the products or any part thereof delivered hereunder and/or with respect to any non-conformance or defect in any such product and/or part thereof delivered hereunder and/or with respect to any non-conformance or defect in any such product and/or part thereof delivered hereunder, or any other warranties or guarantees, including but not limited to any liability of Clear-Com for any consequential and/or incidental damages and/or losses (including loss of use, revenue, and/or profits). In any event, the maximum extent of Clear-Com's liability to customer hereunder shall not under any circumstances exceed the cost of repairing or replacing any part(s) found to be defective within the warranty period as aforesaid.

## **RETURNING EQUIPMENT FOR REPAIR**

All equipment returned for repair must be accompanied by:

- Documentation stating the return address, telephone number, date of purchase, and a description of the problem.
- A repair reference number.

To obtain a repair reference number, contact the appropriate Technical Service Center at the phone numbers or Web site listed below. Our representatives will give you instructions and addresses for returning your equipment. By talking with our representatives, many problems can be resolved on the phone.

### **For returns from Europe, the Middle East, and Africa**

Call: +49 40 66 88 40 40 Monday through Friday 09:00 – 17:00 (GMT)  
+49 40 66 88 40 41 anytime, any day  
(But you must have your PIN number ready)

Web site: [www.clearcom.com](http://www.clearcom.com)

### **For returns from the Americas and Asia**

Call: +1 510 337 6600

Web site: [www.clearcom.com](http://www.clearcom.com)

Email: [customerservicesUS@vitecgroupp.com](mailto:customerservicesUS@vitecgroupp.com)

FAX: +1 510 337 6699

